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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/827,148

04/19/2004

James F. Stevens

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EXAMINER

RIDLEY, BASIA ANNA

ART UNIT

PAPER NUMBER

1764

MAIL DATE

DELIVERY MODE

05/21/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/827,148

Applicant(s)

STEVENS, JAMES F.

Examiner

Basia Ridley



Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-37 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-19, drawn to an apparatus, classified in class 48, subclass 127.9.
  - II. Claims 20-37, drawn to a method, classified in class 423, subclass 652.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process, such as one which does not comprise specific temperatures and/or operation modes recited in the method claims.
3. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.
5. Once the applicant elects one of the above specified Inventions, a further restriction is required between following, patentable distinct Species, as set forth below.

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- a. This application contains claims directed to the following patentably distinct species of the system:

Species a-1 as shown in Fig. 1;

Species a-2 as shown in Fig. 2;

Species a-3 as shown in Fig. 3.

The species are independent or distinct because they are mutually exclusive.

- b. This application contains claims directed to the following patentably distinct species of the catalyst bed:

Species b-1 wherein the reforming catalyst and the CO<sub>2</sub> fixing material in the catalyst bed have a uniform distribution of components along the reactants' pathway through the bed, as described in specification (P4/L24-26 and P16/L10-P17/L6);

Species b-2 wherein the reforming catalyst and the CO<sub>2</sub> fixing material in the catalyst bed have a non-uniform distribution of components along the reactants' pathway through the bed, and wherein the non-uniform distribution is achieved by providing a generally smooth distribution of reforming catalyst that decreases across the bed from inlet to outlet, as described in specification (P4/L24-26 and P16/L10-P17/L6); and

Species b-3 wherein the reforming catalyst and the CO<sub>2</sub> fixing material in the catalyst bed have a non-uniform distribution of components along the reactants' pathway through the bed, and wherein the non-uniform distribution is achieved by providing a plurality of reaction zones that

have generally decreasing concentration of reforming catalyst that decreases from inlet to outlet, as described in specification (P4/L24-26 and P16/L10-P17/L6).

The species are independent or distinct because they are mutually exclusive.

c. This application contains claims directed to the following patentably distinct species of the hydrogen storage device:

Species c-1 wherein the hydrogen storage device comprises a compressor and a high pressure storage vessel, as described in specification (P5/L3/13);

Species c-2 wherein the hydrogen storage device comprises a storage vessel and hydrogen fixing material, as described in specification (P5/L3/13); and

Species c-3 wherein the hydrogen storage device comprises a liquefaction unit and liquid hydrogen storage vessel, as described in specification (P5/L3/13).

The species are independent or distinct because they are mutually exclusive.

d. This application contains claims directed to the following patentably distinct species of the heater arrangement:

Species d-1 wherein one heat generating means is used to provide heat to the system, as described in specification (P12/L16-P13/L7); and

Species d-2 wherein two or more heat generating means are used to provide heat within different temperature ranges, as described in specification (P12/L16-P13/L7).

The species are independent or distinct because they are mutually exclusive.

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e. This application contains claims directed to the following patentably distinct species of the heat exchanging means;

Species e-1 wherein the heat exchanging means comprises electrically resistant coil that are embedded within the catalyst bed, as described in specification (P12/L16-26);

Species e-2 wherein the heat exchanging means comprises heat transfer devices within the catalyst bed that are operably coupled with separate heat generating means, such as resistant heating coils, as described in specification (P12/L16-26);

Species e-3 wherein the heat exchanging means comprises heat transfer devices within the catalyst bed that are operably coupled with separate heat generating means, such as burner or combustor, as described in specification (P12/L16-26);

Species e-4 wherein the heat exchanging means comprises heat transfer devices within the catalyst bed that are operably coupled with separate heat generating means, such as fuel cell exhaust, as described in specification (P12/L16-26); and

Species e-5 wherein the heat exchanging means comprises heat transfer devices within the catalyst bed that are operably coupled with separate heat generating means, such as hydrogen storage system exhaust, as described in specification (P12/L16-26).

The species are independent or distinct because they are mutually exclusive.

f. This application contains claims directed to the following patentably distinct species of the method:

Species f-1 wherein, after the heating of the catalyst bed to calcination temperature, the catalyst bed is allowed to cool down to the reforming temperature, as described in specification (P5/L28-P7/L3 and P17/L7-P18/L3); and

Species f-2 wherein, after the heating of the catalyst bed to calcination temperature, the catalyst bed is hydrated with steam and then heated to the reforming temperature, as described in specification (P5/L28-P7/L3 and P17/L7-P18/L3).

The species are independent or distinct because they are mutually exclusive.

6. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species (either a-1 or a-2 or a-3 and either b-1 or b-2 or b-3 and either c-1 or c-2 or c-3 and either d-1 or d-2 and either e-1 or e-2 or e-3 or e-4 or e-5 and either f-1 or f-2) for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none of the claims appears to be generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

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7. Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

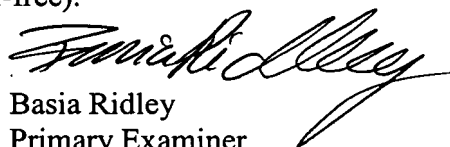
Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).



Basia Ridley  
Primary Examiner  
Art Unit 1764